

Advanced Mac OS X Wireless Tips and Tricks

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Overview

- Technology Overview
- WI-FI
 - Extending Range
 - Third party cards
 - Useful Applications, Demos
- Bluetooth
 - Tips, Demos
- Q & A



Wireless Technologies

- Technologies Used by Apple
 - Airport, 802.11b, Wi-Fi
 - Airport Extreme, 802.11g, Wi-Fi
 - Bluetooth
- Differences
 - Power
 - Modulation
- Interference Minimization



Wireless Technology Differences

- Wi-Fi
 - Hi power, longer range, fast
 - Looks like Ethernet
 - Channelized
- Bluetooth
 - Low power, short range, slow
 - Good serial cable replacement
 - Object Exchange (OBEX) protocol



Differences: Modulation

- Frequency Hopping vs. Direct Sequence
 - DSSS spreads the energy in a wave over a channel
 - FHSS puts energy in bursts over the channel
 - When they compete DSSS needs more signal to win
- CCK (802.11b) vs. OFDM (802.11g)
 - OFDM uses multi-path, CCK sees it as interference
 - 802.11g poor adjacent channel rejection, use 1 or 11
 - 802.11g is better indoors, many similar length paths



Interference Reduction

- Adjacent Frequency Rejection
 - 802.11b more robust than current 802.11g
 - 802.11b more aggressive than 802.11g
- Avoidance
 - 802.11 channelization
 - Dynamic avoidance in bluetooth
- Phones and Other Wireless
 - Most use FHSS, 900Mhz or 5.8Ghz devices are best



Maximizing Signals

- Better signal means higher speed
- Better signal means higher reliability
- Radio Tips
 - Take off path - keep the antenna away from objects
 - Polarization - try tilting the antenna
 - Directional antennas - focus the energy where needed
 - Power - Start low, increase power if needed



Maximizing Signals

- Base Stations
 - Better Placement, Orientation
 - Adding an External Antenna
 - Increasing Power
- Laptops
 - Adding Antennas
 - Using a Third Party External Card



Third Party Card Hardware

- PCCARD
 - Airport - Prism2/2.5/3, Cisco
 - AirPort Extreme - Broadcom
- USB
 - AirPort - Belkin
- PCI Cards
 - AirPort Extreme - Broadcom based cards



Third Party Card Drivers

- Prism2/2.5/3 Cards
 - IO Experts, WirelessDriver (source forge)
- Cisco Cards
 - Cisco
- Broadcom Based Cards
 - AirpPort Extreme Drivers
- USB Cards
 - Provided with hardware



Useful Wi-Fi Utilities from Apple

- Finding Networks
 - Airport Menu
- Signal Quality
 - Internet Connect
- Connection Speed
 - Network Utility



Useful Wi-Fi Utilities

- macstumbler, istumbler
 - Find and Map Networks
- kismac
 - Excellent multi-purpose Wi-Fi tool
- xwepgen
 - Generate Apple usable keys for Wi-Fi “passphrases” used by other vendors



Demos

- Finding Networks
- Signal Quality
- Network Speed
- Macstumbler with GPS
- Kismac and Ethereal



Bluetooth Uses

- Get Rid of Serial Cables
- Keyboards and Mice
- Remote Control
- GPS without Cables
- Connectivity to the Internet (Cell Phone, AP)
- Sharing Internet Connectivity with PDA
- Transfer Notes, Calendars, Contacts



Bluetooth Tips

- Is the Device Worth Potential Interference?
- Security
 - Don't walk around discoverable
 - Enable and require Encryption
 - Check paired devices occasionally
- Cell Phone Internet is Expensive
- Turn it Off When Not Needed
 - Better security, reduced interference, better battery life



Bluetooth Demos

- Pairing and Security Example



Questions & Answers

- <http://www.toaster.net/wireless/macosex>



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